

*March 2016, Bandung*

# Outlook Indonesian Energy Mix

Pre-workshop ITB

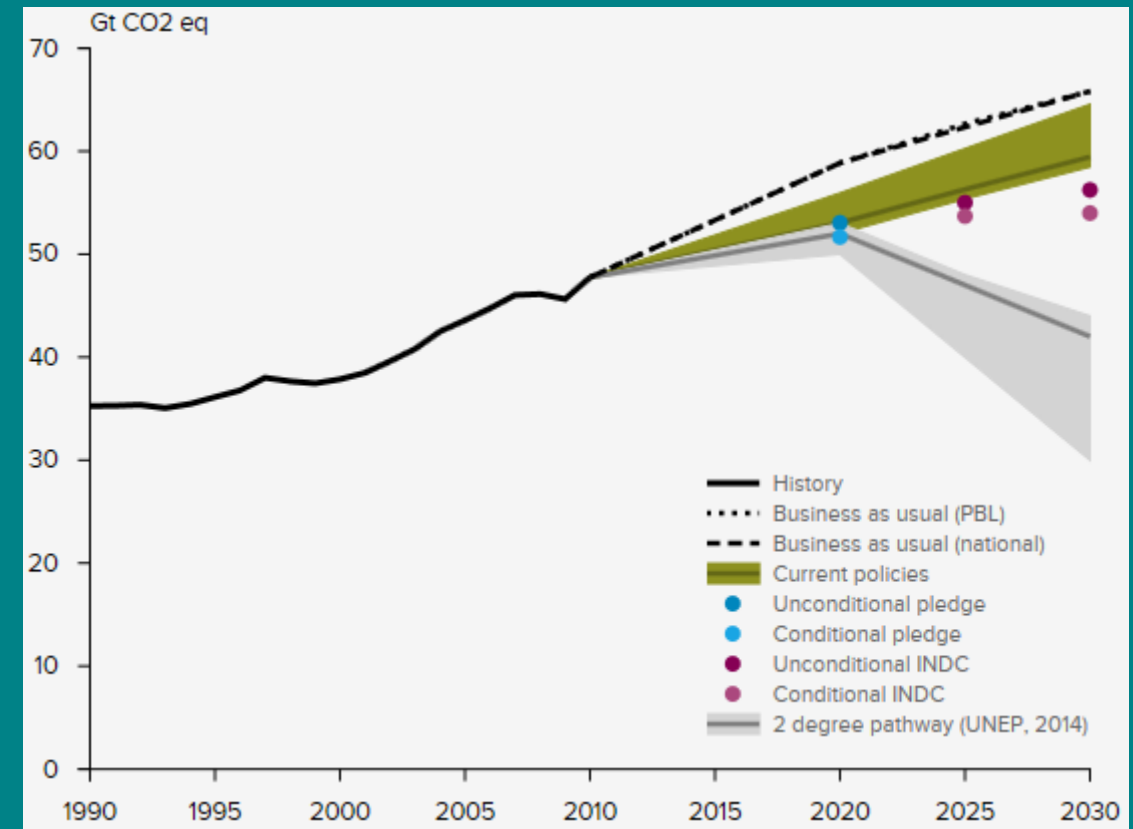
*Ali Ashat*

# INDC submission Indonesia

- Government claims:
- 6% 2014 → 23% 2025 → 31% 2050

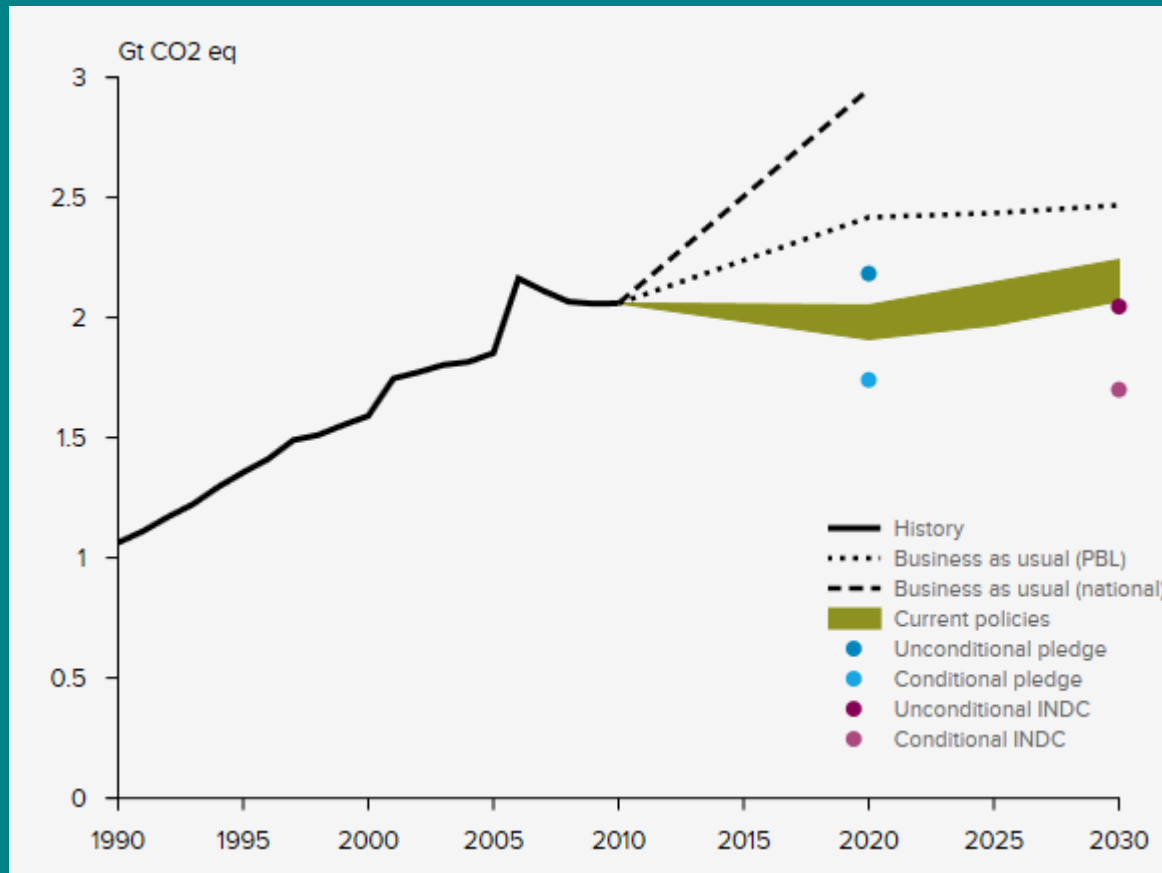
# Paris Climate Conference (COP21)

- New binding climate agreement
- Keeping the rise in temperature below 2°C
- Rich, developed countries should help developing countries with money to reduce their emissions. Every year there should be EUR 91 billion available
- The agreement will enter into force (and thus become fully effective) only if 55 countries which produce at least 55% of the world's greenhouse gas emissions ratify the Agreement
- Rachmat Witoelar, Indonesian President Joko Widodo's Special Envoy for Climate Change, said Indonesia supports the 1.5°C warming cap in the agreement instead of its previously committed 2°C.



# Indonesia

Share of global emissions in 2010: 4.3 %



Mitigation measure(s) with highest impact:

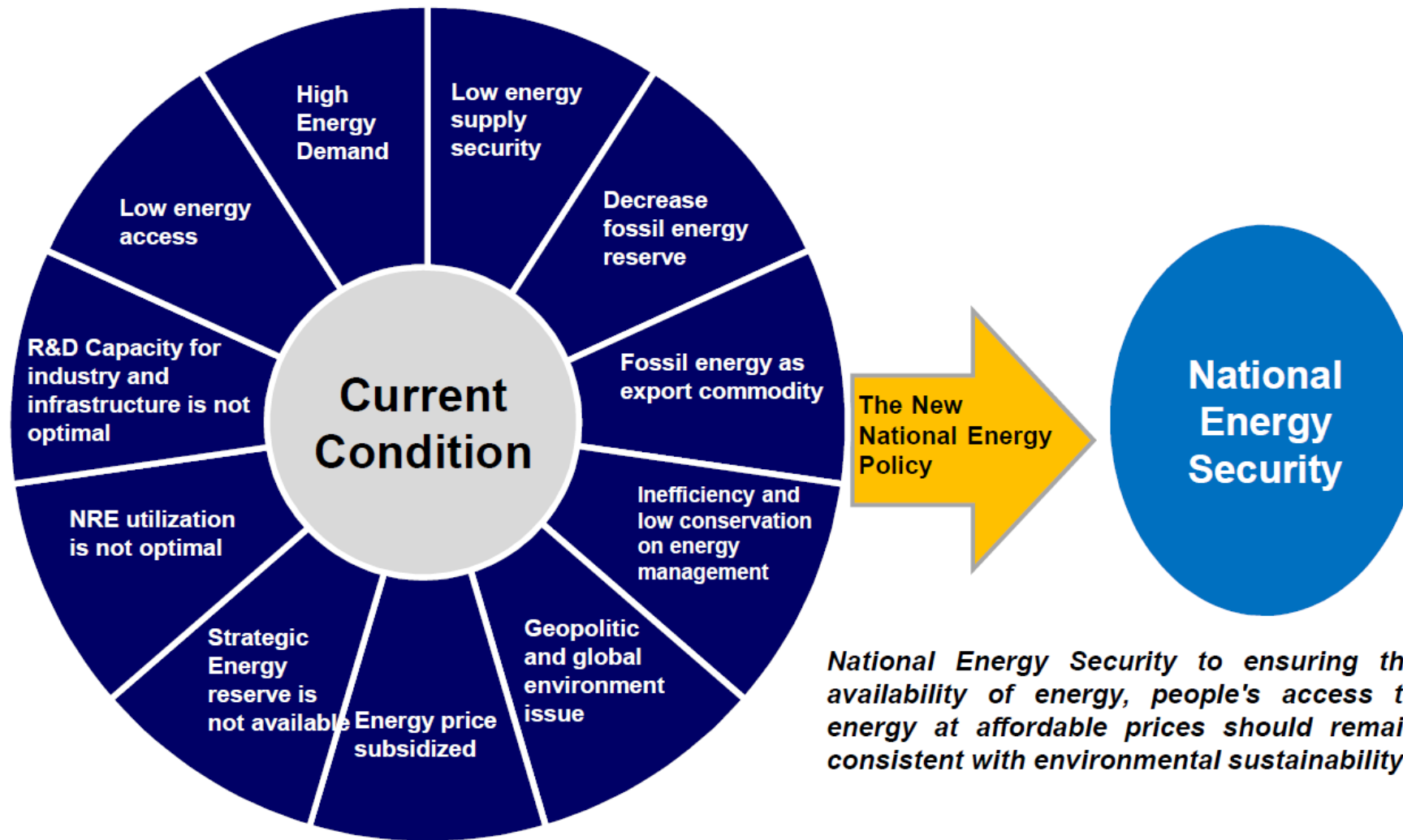
- Forestry measures (policies on logging and controlling peat land fires) including the FLEGT programme
- Target of a 15% to 23% share of renewable energy in primary energy supply by 2025 (National Energy Policy)
- Biofuel quota: 15% share of biofuels in all transport fuels by 2025

Result(s)

- The projected 2020 and 2030 emission levels resulting from the policies show a wide range due to the uncertainty in emissions from LULUCF.
- The uncertainty makes it difficult to determine the ambition level of the pledge and whether the pledge and INDC will be achieved.



## NATIONAL ENERGY CHALLENGES





## EXPECTED CONDITIONS

### CURRENT CONDITION

- High Energy Demand
- Energy supply security has not kept up with the increase in demand
- Fossil energy reserve decreasing
- Limited access to energy : inadequate/lack of infrastructure
- Fossil energy as export commodity
- Oil imports increased
- Low energy efficiency and conservation in energy management
- NRE utilization is still not-optimal
- Energy reserves are limited

### Increasing of National Energy Security

### EXPECTED CONDITIONS

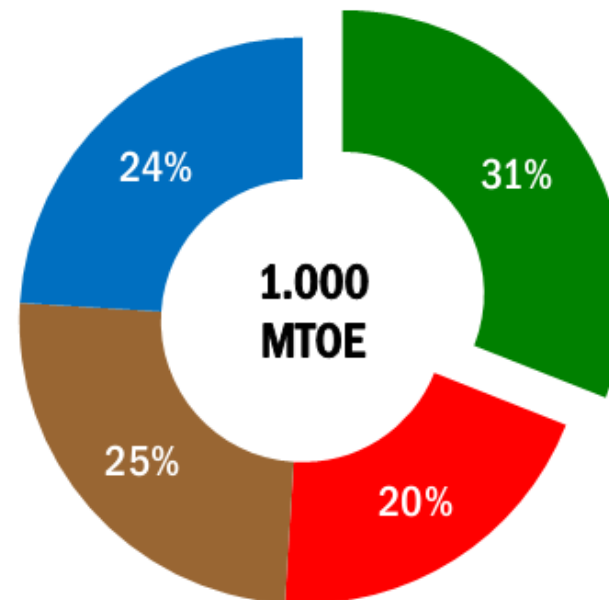
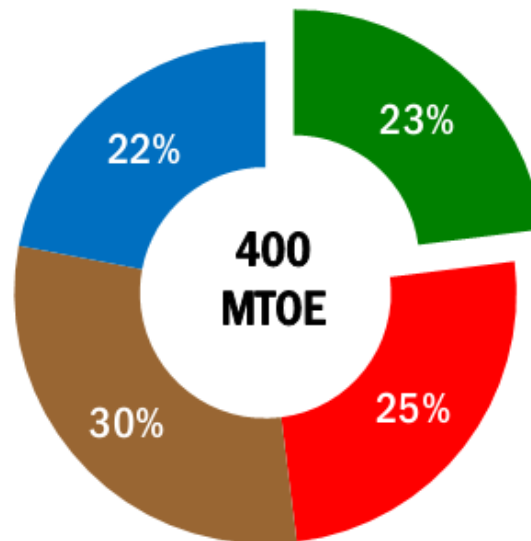
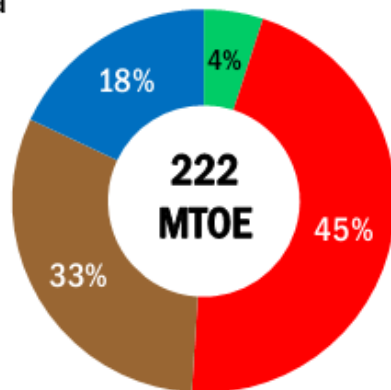
#### Actualizing energy security and energy independency in support of sustainable national development :

- change of energy management paradigm;
- independency on energy management;
- secure energy availability;
- optimal energy resources management;
- energy utilization efficient ;
- Increased access to energy services for the public;
- enhancing self-reliance in technological capability and capacity in energy industry
- Job/and employment availability, and
- conservation of the environment



# BAURAN ENERGI NASIONAL

- Energi Baru dan Terbarukan
- Minyak Bumi
- Gas Bumi
- Batubara



	Saat ini
Pembangkit Total	55 GW
Konsumsi Energi	0,9 TOE/kap
Konsumsi Listrik	788 KWh/kap

	2025
Pembangkit Total	115 GW
Konsumsi Energi	1,4 TOE/kap
Konsumsi Listrik	2.500 KWh/kap

	2050
Pembangkit Total	430 GW
Konsumsi Energi	3,2 TOE/kap
Konsumsi Listrik	7.000 KWh/kap



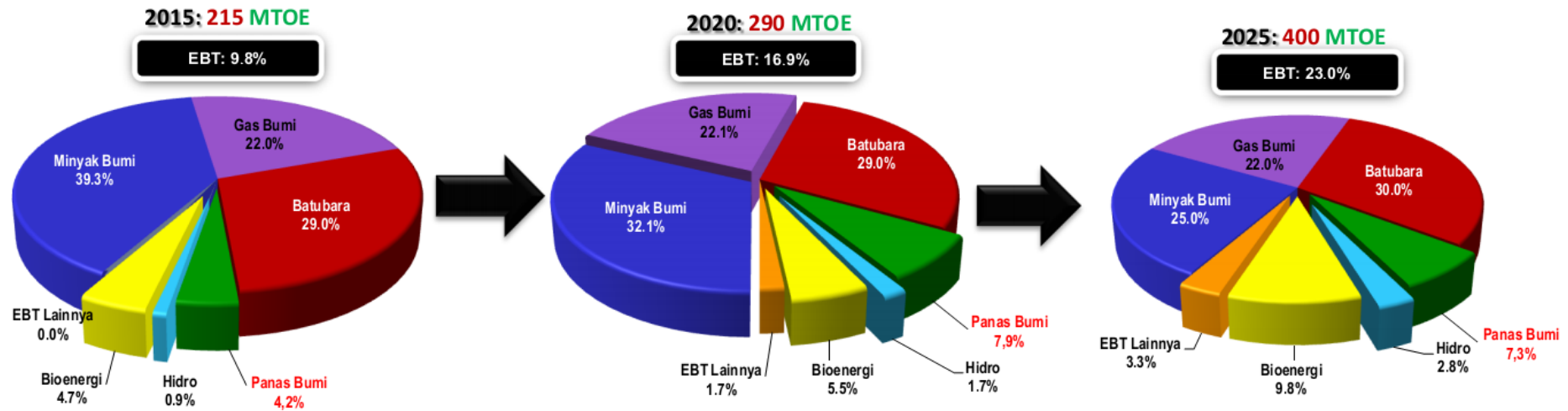


## MAJOR COMPONENTS OF NATIONAL ENERGY POLICY

- Shifting paradigm in energy resource management from being treated as commodity towards development capital:
  - used for national needs
  - support and strengthen the competitiveness of national industries
  - energy resources should not be exported in the form of primary energy
- Reduce oil dependency, The share of oil on national energy mix should be less than 25% in 2025
- Increase the share of Renewable Energy to around 23% in 2025 and 31% in 2050
- Increase the access of people to energy, Electrification ratio shall be around 100% in 2020
- Enhance energy conservation, Reduce energy elasticity to less than 1 in 2025
- Establish Strategic Energy Reserves (SER)
- Energy development shall consider the balance of economic viability, energy supply security and environmental preservation



# PROYEKSI PENGEMBANGAN ENERGI BARU TERBARUKAN BAURAN ENERGI DAN POTENSI EBT



## Energi Baru

- Batubara Tercairkan (*Liquified Coal*)
- Gas Metana Batubara (*Coal Bed Methane*)
- Batubara Tergaskan (*Gasified Coal*)
- Nuklir
- Hidrogen
- Metana yang lain

## Energi Terbarukan

- Panas Bumi,
- Aliran dan Terjunan Air (Hidro),
- Bioenergi,
- Sinar Matahari,
- Angin,
- Gerakan dan Perbedaan Suhu Lapisan Laut.

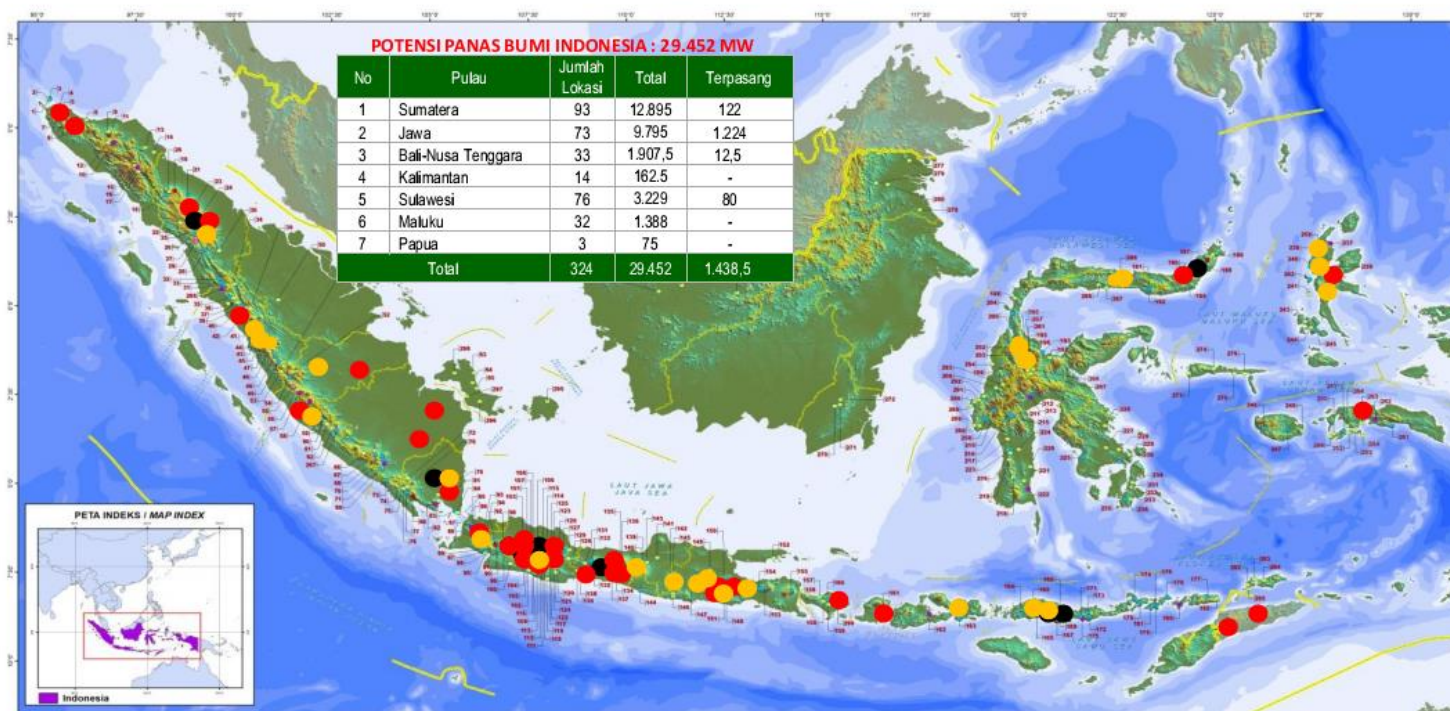
POTENSI ENERGI TERBARUKAN				
NO	ENERGI BARU TERBARUKAN	SUMBER DAYA (SD)	KAPASITAS TERPASANG (KT)	RASIO KT/SD (%)
1	Hidro	75.000 MW	7.572 MW	10,1 %
2	Panas Bumi	29.452 MW	1.438,5 MW	4.8 %
3	Biomassa	49.810 MW	1.716,5 MW	5,26 %
4	Surya	4,80 kWh/m <sup>2</sup> /day	42,77 MW	-
5	Angin	3 – 6 m/s	1.87 MW	-
6	Samudera	49 GW **)	0.01 MW ****)	-
7	Uranium	3.000 MW *)	30 MW **)	-

\*) Hanya di Kalan – Kalimantan Barat  
\*\*) Sebagai pusat penelitian, non-energi

\*\*\*) Sumber: Dewan Energi Nasional  
\*\*\*\*) Prototype BPPT



# POTENSI PANAS BUMI INDONESIA



**BELUM BERPRODUKSI : 3210 MW**

No.	WKP	Renc. Pengembangan (MW)	Rencana COD
1	Sibual-Buali	3 x 110	2016, 2017, 2018.
2	Hululais - Tambang Sawah	2 x 55	2018, 2019.
3	Lumut Balai	4 x 55	2016, 2018, 2019.
4	Sungai Penuh	2 x 55	2019
5	Karah-Cakrabuana	1 x 30, 2 x 55	2016, 2019.
6	Buyan Bratan (Bedugul)	1 x 10	2018
7	Kotamobagu	2 x 40	2022, 2025
8	Iyang-Argopuro	1 x 55	2019
9	Tulehu	2 X 10	2018, 2019
10	Cibuni	10	2017
11	Ciater	30	2019
12	Liki Pinangawan Muaralaboh	220	2017, 2018.
13	Gn. Rajabasa	220	2018, 2019
14	Jaboi	10	2018
15	Sorik Marapi-Roburan-Sampuraga	240	2018, 2019.
16	Cisolok Cisukarame	45	2017
17	Gn. Tangkuban Perahu	110	2017
18	Gn. Tampomas	40	2018
19	Gn. Ungaran	55	2017
20	Sokoria	15	2017, 2018, 2019.
21	Atadei	10	2016
22	Jailolo	10	2019
23	Suoh Sekincau	220	2018, 2019.
24	Hufu Daha	20	2018, 2019.
25	Kaldera Danau Banten	110	2019
26	Rantau Dedap	220	2018
27	Blawan - Ijen	110	2019
28	Telaga Ngebel	165	2019
29	Baturaden	220	2018, 2021.
30	Guci	55	2019
<b>Total</b>		<b>3.210</b>	

**PLTP YANG TELAH BEROPERASI : 1.438,5 MW**

No.	PLTP	Kapasitas Total (MW)
1	Sibayak	12
2	Salak	377
3	Wayang Windu	227
4	Patuha	55
5	Kamojang	235
6	Darajat	270
7	Dieng	60
8	Lahendong	80
9	Ulubelu	110
10	Ulumbu	10
11	Mataloko	2,5
<b>Total</b>		<b>1.438,5</b>

● Telah Berproduksi

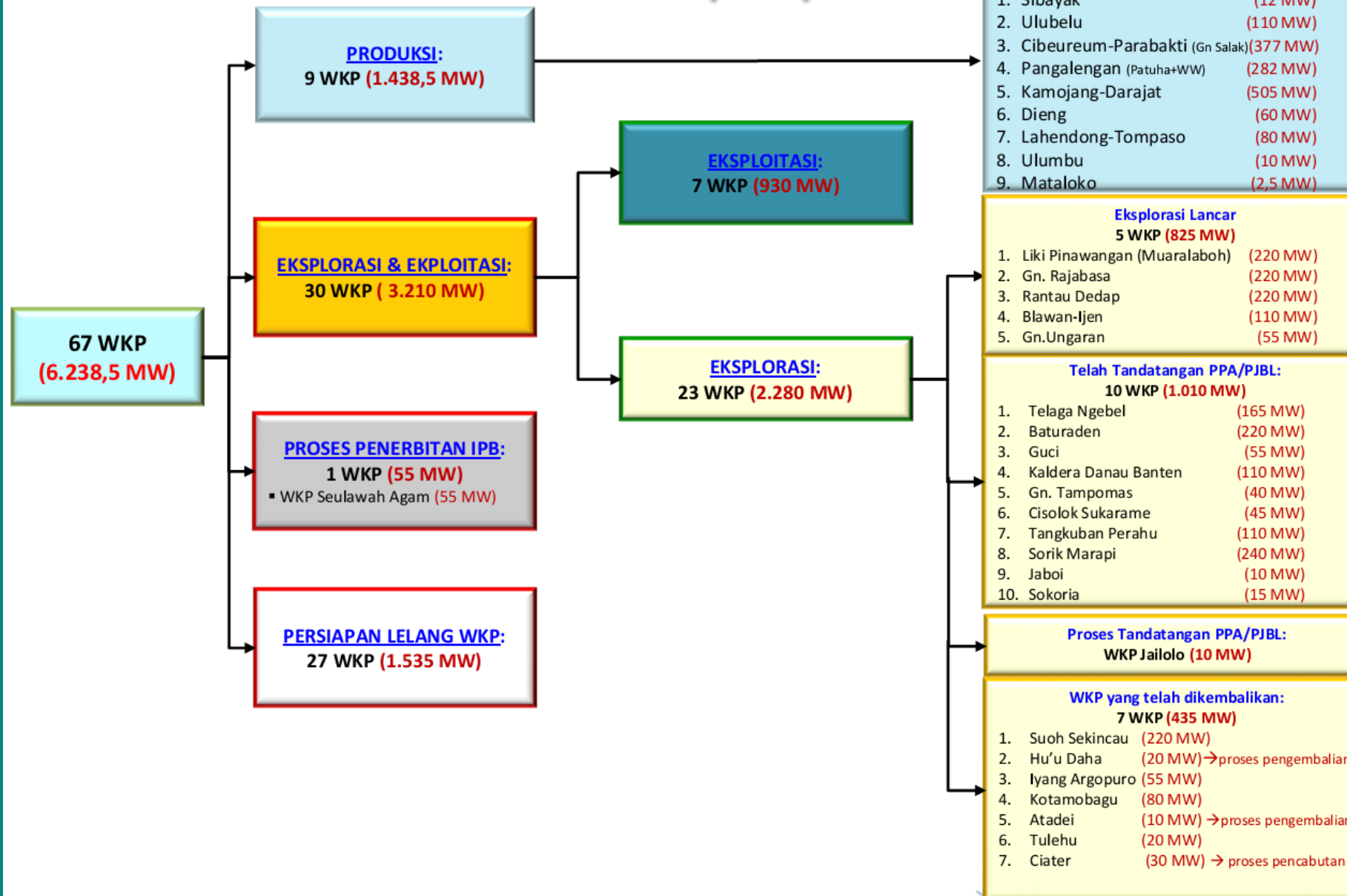
● Belum Berproduksi

**PLTP BELUM TERBIT IZIN DAN/ATAU PERSIAPAN LELANG : 1.590 MW**

No.	Wilayah Kerja	Rencana Kapasitas (MW)	No.	Wilayah Kerja	Rencana Kapasitas (MW)	No.	Wilayah Kerja	Rencana Kapasitas (MW)
1.	Borjol	60	11.	Gunung Lawu	165	21.	Bora Putu	40
2.	Gn. Talang - Bukit Kili	20	12.	Sipoholon Ria-Ria	20	22.	Gn. Hamiding	2 x 5
3.	Way Ratai	55	13.	Kepahiang	110	23.	Telaga Ranu	2 x 5
4.	Gunung Endut	40	14.	Simbolon Samosir	110	24.	Songa Wayaua	2 x 2,5
5.	Candi Umbul Telomoyo	55	15.	Danau Ranau	110	25.	Gn. Geureudong	2 x 55
6.	Gunung Willis	20	16.	Graho Nyabu	110	26.	Gn. Galunggung	2 x 55
7.	Gunung Arjuno Welirang	110	17.	Suwawa	20	28.	Gn. Ciremai	110
8.	Gunung Pandan	10	18.	Sembalun	20	27.	Seulawah Agam (Proses penerbitan IPB)	55
9.	Gunung Gede Pangrango	55	19.	Oka-Ile Ange	10			
10.	Songgonti	20	20.	Marana	20			
<b>Total</b>		<b>1.590</b>						

● Akan Lelang

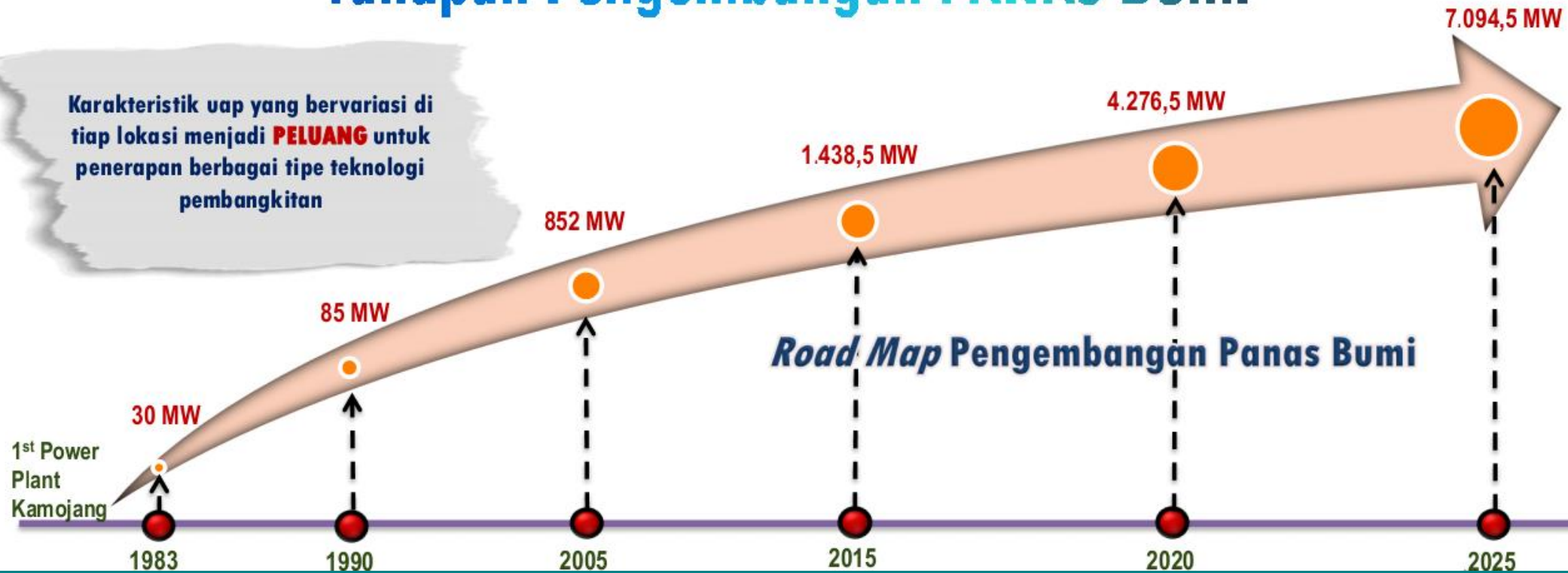
# STATUS WILAYAH KERJA PANAS BUMI (WKP)





# Tahapan Pengembangan PANAS BUMI

Karakteristik uap yang bervariasi di tiap lokasi menjadi **PELUANG** untuk penerapan berbagai tipe teknologi pembangkitan



# Challenges to geothermal investments

- High upfront costs for exploration
- Insufficient financial support, incentive, tariffs
  - Create framework to identify risks & costs, so that measures can be taken
- Limited information & data base on resources
  - Risk mitigation by portfolio management
  - Development of failure database
- Location of geothermal fields in conservation/ protected forest/ rural areas
  - Equatorial principles

# Barriers

- Economic barriers - higher capital costs for geothermal than fossil
- Regulatory barriers - absence of a clear regulatory framework
- Financial risks - project risks like credit, contractual and fuel supply risks
- Market related risks - political risk and macroeconomic risk

# New geothermal law – 17 Sept 2014

Improvements to some of the issues that have hindered geothermal projects in Indonesia:

- Distribution of authority of government institutions over direct and indirect use of geothermal resources
- Forestry issues in geothermal development
- Licensing procedures

Key points of the new law included the following:

- (a) Bill distinguishes between direct and indirect use. Law assigns authority for licencing in
  - (a) direct use is held by central and/or provincial and/or regency government based on its location
  - (b) indirect use to the central government only, represented by MEMR
- (b) Geothermal activities would no longer be considered mining activities
- (c) New geothermal projects will be developed under new, more favourable, pricing arrangements.
- (d) Local administrations will receive a portion of the revenues derived from geothermal resources.
- (e) Quite detailed provisions were set out regarding such things as surveys of geothermal sites, exploration, tendering procedures, the size of working areas, arrangements for determining prices and administrative sanctions, obligations of the holders of geothermal licenses, and so on



# Policy making

- transferred responsibility for award of concessions (Geothermal Working Areas) back to central government, under the Minister of Energy
- Development of indirect use project needs to reflect Government policy in terms of prioritisation
- addressing the regulations required to implement the new law, we need to start by understanding the geothermal development process, the various stages involved, what those stages are trying to achieve and how they interact with each other
- development process should be one of limiting risk by limiting financial exposure until the risk of failure is reduced

# Taxation of geothermal in Indonesia

Non tax – fixed fees, production fees and other state levies in accordance with the provisions of legislation.

Tax – customs duties and other taxes

# Non tax – fixed fees, production fees etc

1. Fixed levy (Land rent): *Geothermal fixed levy has not yet been determined, in the mean time fixed fees for general mining apply. Levy paid to the State in return for the opportunity general investigation, exploration, feasibility studies, construction and exploitation of the mining area.*

Fixed Contribution (USD) = Province Area (Ha) x Rates (USD / ha / year)

- 20% to the Central Government
- 80% to the local government, divided as follows:
  - 16% Province
  - 64% of Regency/ city

1. Production Levy (Royalty): *Royalties are relatively small fees: 0.5% from the sale of electricity (total project) or 1% of the sale of steam (steam field project)*
  - 20% for the Central Government
  - 80% for local government, divided:
    - 16% Province;
    - 32% Regency / City Produce;
    - 32% to other relevant regencies / cities in the province

# Periods of permission and fees

- General research: 1 year + 1 year extension.
- Exploration: 3 years + two extensions of 1 year.
- Feasibility Study: 1 year + 1 year extension.
- Construction: 3 years.
- Production: 30 years + two extensions of 10 years.

NO.	Activity stage	TARIF/HA/year (Rupiah)	
1.	<b>General Survey</b>		
	First year	Rp	500,00
	Second year	Rp	1.000,00
2.	<b>Exploration</b>		
	First year	Rp	2.000,00
	Second year	Rp	2.500,00
	Third year	Rp	3.000,00
3.	<b>Extension of Exploration</b>		
	First year	Rp	5.000,00
	Second year	Rp	7.000,00
4.	<b>Construction</b>		
	First year	Rp	8.000,00
	Second year	Rp	8.000,00
	Third year	Rp	8.000,00
5.	<b>Exploitation</b>		
	Endapan laterit	Rp	15.000,00
	Endapan primer, eluvial dan aluvial	Rp	25.000,00

# Taxes

Gross Income	Tax rates
< 4.8 billion Rp	1 % of gross income
4.8 – 50 billion Rp	(25 – 0,6 bil/ gross income) x gross income
> 50 billion Rp	25 % of gross income

## 1. Corporate tax

- Income tax, is charged to the geothermal developer (contractor) if the cumulative taxable income is positive
  - Tax rate for fiscal year 2015 was 25% of taxable income
  - Public companies who trade at least 40% (forty percent) of the total paid-up shares on the stock exchanges in Indonesia and meet certain other requirements can obtain a rate of 5% (five percent) discount than the rates are regulated by or based on Government Regulation.
  - The taxpayer in the country with a gross income of up to Rp 50,000,000,000.00 (fifty billion rupiah) got the facilities in the form of tariff reduction of 50% (fifty percent) of that rate (25%) imposed on taxable income from the gross income up to USD 4,800,000,000.00 (four billion, eight hundred million rupiah).
  - For the purposes of the application of the tax rate, the amount of taxable income rounded down in thousands of rupiah full.
  - Tax Rates Article 17 and 31 E levied on the taxable income of the taxpayer which is not included in the criteria taxpayer who has been subject to income tax article 4 paragraph 2 under Regulation 46 in 2013.

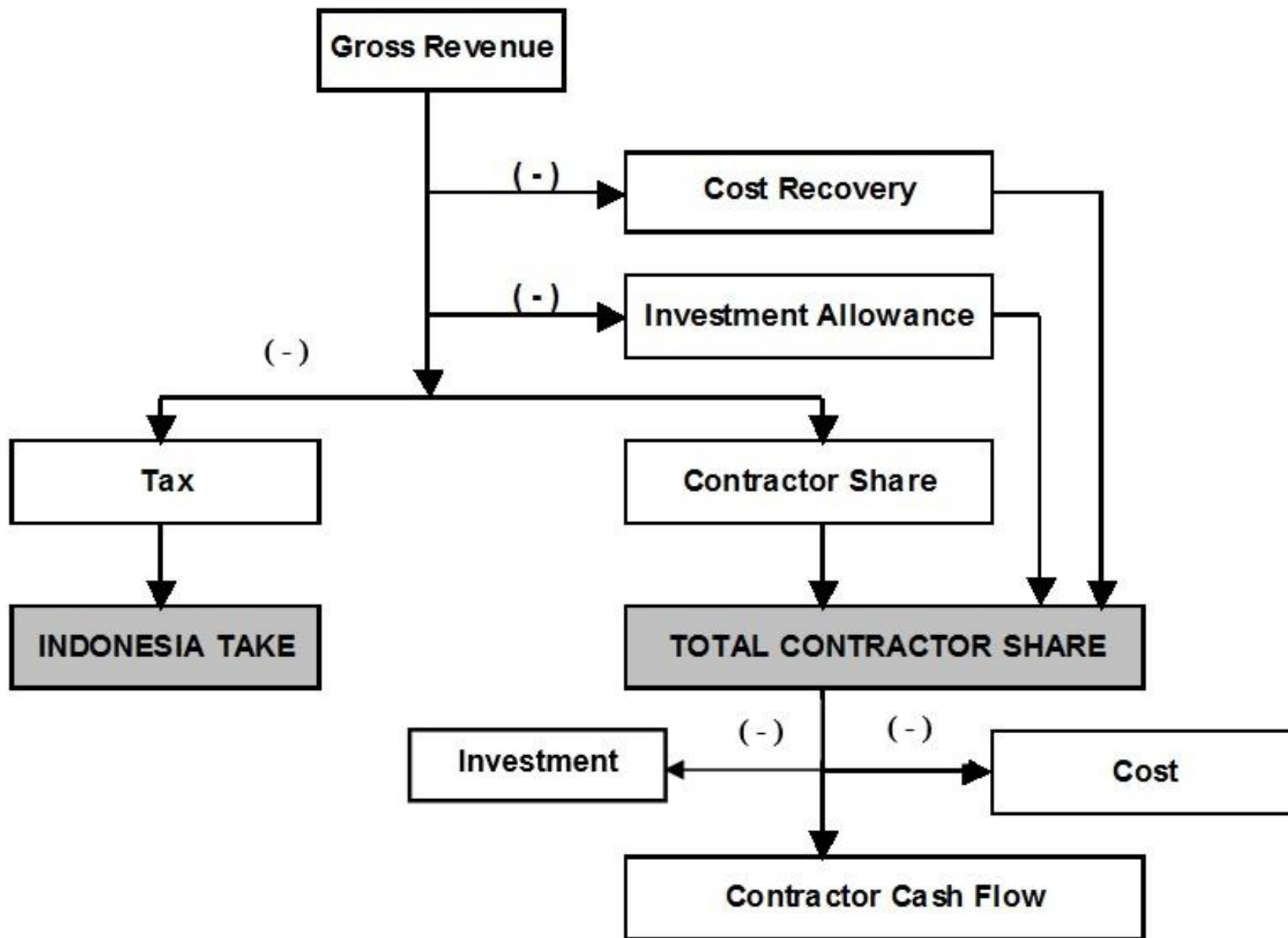
Thus, the income tax is relevant for geothermal is 25% of taxable income as in Point 1 above. However, if a business entity in the form of a public company as stated in Point 2 above, the tax amount is 20%

- Dividend tax
  - 10% for the company's Domestic Investment
  - 20% for a Foreign Investment Company

Foreign company from a country with a tax treaty might be lower (which means that if a company comes from a country that does not tax the dividend the company is taxed 0%.)

# Taxes

1. Corporate tax (income tax and dividend tax)
2. Value Added Tax (VAT) - VAT is charged on goods and services in the country, the magnitude of 10%. The impact of the imposition of VAT is 10% increase in investment costs for the components of domestic goods and services.
3. Import Tax - The amount of import duties and PDRI include import duties, import VAT and Income Tax (Income Tax). Great from import duties for components that have the facility of Master List of between 0 to 10%, but for facilities that do not have a master list could reach 15%, 10% import VAT and income tax of 2.5%.
4. Other Taxes - Another tax is charged at the United Nations (Property Tax), but compared to the other tax component, the UN is relatively small





# Tax Incentives

Tax incentives in order to encourage economic growth, regional economic development and job creation. Expected to give a further incentive for investors to invest in Indonesia because it guarantees legal certainty in investing.

## 1. Tax incentives provided:

- Reduction of net income of 30% of the total investment, is charged for 6 years respectively at 5% per year. The goal is to accelerate depreciation and amortization
- Income Tax on dividends paid to foreign tax subject to a lower rate at 10% or rates according to Tax Treaty in force, whichever is lower
- Compensation for losses that are longer than 5 years but not more than 10 years with certain criteria.

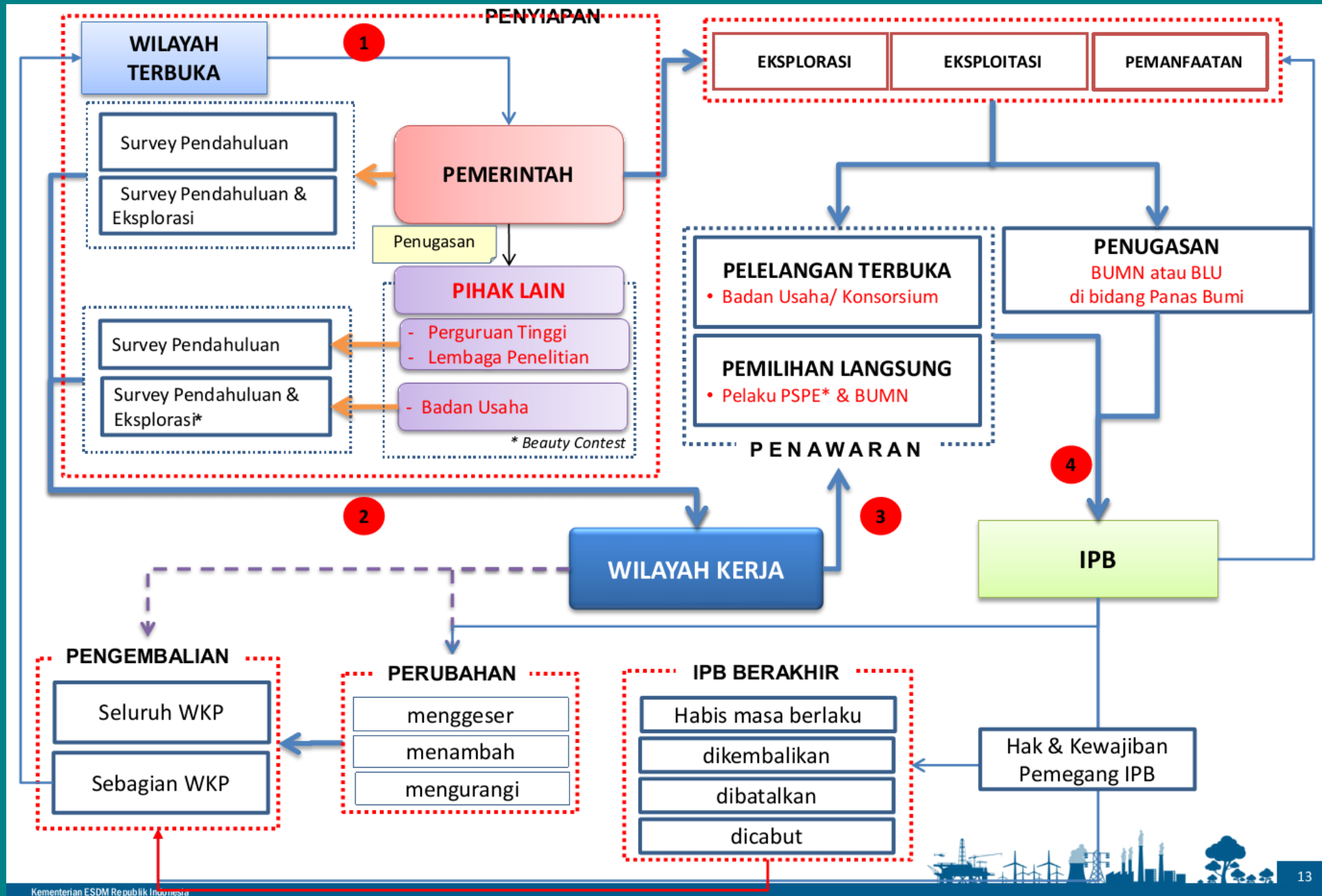
## 2. Things that need to be considered:

- Taxpayers who have obtained a tax on business activity in Integrated Economic Development Zone based on Government Regulation No. 20 of 2000 on Taxation Treatment in Integrated Economic Development Zone, as amended by Government Regulation No. 147 of 2000, the business activities of the no longer given tax incentives referred to in this government regulation;

## 3. As a note in the analysis of the economics of geothermal project:

- Dividend taxes levied if the dividends distributed to share holders while reinvested not taxed.
- Depreciation method used is the Double Declining Balance considering the permissibility of the use of the accelerated method in income tax above. Accelerated method could mean Declining Balance or Double Declining Balance but from the investment side, Double Declining Balance method would be more profitable / interesting. The term of depreciation because it is not dealt with specifically, it can refer to the rules that have been adopted

*Kep. Men. Finance 766/ KMK.04/ 1992 for 7 years. Thus the rate of depreciation will be 2/7 or 28.57%.*



# Feed in tariffs

Table 1: FiTs for renewable energy sources in Indonesia

Energy source	Feed-in tariff	Conditions	Relevant legislation
<b>Geothermal</b>	US\$ 0.01 - 0.19/kWh	Depends on location, and whether the power plant is connected to a high- or medium voltage network	MEMR Regulation No. 22 of 2012
<b>Mini and Micro hydro</b>	Rp 656 - 1,506/kWh	<10 MW, dependent on location and whether connected to low or medium voltage network	MEMR Regulation No. 4 of 2012
<b>Biomass</b>	Rp 975 - 1,722.5/kWh		
<b>Municipal solid waste (non-biogas)</b>	Rp 1,050 - 1,398/kWh		
<b>Municipal solid waste (landfill gas)</b>	Rp 850 - 1,198/kWh		
<b>Solar PV</b>	Price ceiling US\$ 0.25 - 0.30/kWh	Purchase agreements through tenders. Price ceiling dependent on use of 40% local materials	MEMR Regulation No. 17 of 2013